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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,896	07/03/2003	Yu-Chou Lee	MR3029-77	3708

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EXAMINER	
TRAN, THIEN F	

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/611,896	LEE ET AL.
	Examiner	Art Unit
	Thien F. Tran	2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) *9-15* is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☒ Claim(s) *8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 6 is objected to because of the following informalities: in claim 6, line 2, change "prevent" to --prevents-- to correct grammar.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harano et al. (US 6,317,185) in view of Yaegashi et al. (US 6,376,861).

Harano et al. disclose a thin-film transistor structure (Fig. 9) comprising: an insulating substrate 8; a gate electrode 1 on said insulating substrate; a dielectric layer 9 over said gate electrode; a first semiconductive layer 5 on said dielectric layer; a second semiconductive layer 10 on said first semiconductive layer; a conductive electrode 6 on said second semiconductive layer as a source and a drain electrode; wherein said second semiconductive layer and said conductive electrode have an opening therethrough and exposing said first semiconductive layer 5. Harano et al. do not disclose the conductive electrode 6 comprising three layers each having a same main metal component. Yaegashi et al. disclose a thin-film transistor structure (Fig. 1) comprising: an insulating substrate 10; a gate electrode 18 on said insulating substrate;

a dielectric layer 20 over said gate electrode; a first semiconductive layer 22 on said dielectric layer; a second semiconductive layer 26 on said first semiconductive layer; and source/drain electrodes (36a, 36b) comprising multiple layers of alloy layers wherein at least three layers are made of alloy layers each having a same main metal component. Yaegashi et al. further disclose the source/drain electrodes comprising a first conductive layer 30 of Al alloy containing Ta (col.9, lines 4-6); a second conductive layer 32 of Mo and a third conductive layer 34 of Mo (col. 5, lines 40-41), wherein Mo alloy containing Ta could be used instead of Mo (col. 9, lines 11-14). Therefore, the three layers (30, 32, 34) are made of alloy layers each having Ta as a same main metal component. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to form the source/drain electrode 6 of Harano et al. comprising the multiple layers of alloy layers with side surfaces sloped as taught by Yaegashi et al. in order to improve the reliability of the device. As a result, Harano et al. in view of Yaegashi et al. teach a structure comprising three conductive layers made of alloy layers each having a same main metal component, wherein the second semiconductor layer, the first conductive layer, the second conductive layer and the third conductive layer have an opening therethrough and exposing the first semiconductor layer.

Regarding claim 2, Harano et al. further disclose said gate electrode 1 comprising an AlNd gate electrode.

Regarding claim 3, Harano et al. further disclose said dielectric layer 9 comprising a silicon nitride layer.

Regarding claim 5, Harano et al. further disclose said second semiconductive layer 10 comprises an N-type amorphous silicon layer.

Regarding claim 6, by being positioned between the second conductive layer and the second semiconductive layer, the first conductive layer inherently prevents the second conductive layer and the second semiconductive layer from diffusing into each other.

Regarding claim 7, Harano et al. in view of Yaegashi et al. disclose said third conductive layer 34 formed of Mo containing Ta wherein Mo and Ta are known materials routinely used for a glue (adhesive) layer in semiconductor devices. The third conductive layer 34 of Mo alloy containing Ta has a different etching rate from the second conductive layer 32 of Mo alloy containing nitrogen. Therefore, it is inherent that the third conductive layer 34 is capable of performing as a glue layer and an etch stop layer to protect said second conductive layer 32 from being over-etched.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harano et al. (US 6,317,185) in view of Yaegashi et al. (US 6,376,861) as applied to claim 1 above, and further in view of Hayama (US 5,416,341).

Harano et al. in view of Yaegashi et al. as described above disclose the first semiconductor layer 5 comprising an amorphous silicon layer. Harano et al. do not expressly disclose the amorphous silicon layer 5 being a hydrogenated amorphous silicon layer. Hayama discloses thin film transistors comprising a hydrogenated amorphous silicon active layer. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to form the amorphous silicon layer 5 of a hydrogenated amorphous silicon layer as taught by Hayama in order to have low leakage current between the source and drain regions.

Allowable Subject Matter

Claims 9-15 are allowed.

Claim 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thien F. Tran whose telephone number is (571) 272-1665. The examiner can normally be reached on 8:30AM - 5:00PM Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

tt
October 29, 2005

Thien Tran

THIEN TRAN
PRIMARY EXAMINER